

ABSTRACT

A method and device for changing the rate of density between fluid hydrocarbon fuels and combustion air prior to ignition and combustion in residential, commercial and industrial combustion mechanisms, by extracting heat from the mechanism's combustion zone or flue area to reduce the density of the fuel prior to delivery to the mechanism burner at a constant, pre-set operating temperature of between 100 degrees Fahrenheit and the fuel's flash point temperature, while at the same time providing means to control combustion air temperature to a level such as to increase air density and significantly changing the mass ratio of fuel mass versus combustion air mass, hence oxygen mass, without increasing combustion air volume or fuel volume, thereby improving combustion efficiency, heat transfer efficiency and reduction in harmful stack emissions.